

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
19 December 2002 (19.12.2002)

PCT

(10) International Publication Number
WO 02/100451 A3

(51) International Patent Classification⁷: **A61L 15/60,**
A61F 13/15

(21) International Application Number: **PCT/JP02/05642**

(22) International Filing Date: **7 June 2002 (07.06.2002)**

(25) Filing Language: **English**

(26) Publication Language: **English**

(30) Priority Data:
2001-173392 8 June 2001 (08.06.2001) JP
2001-173417 8 June 2001 (08.06.2001) JP

(71) Applicant (*for all designated States except US*): **NIPPON SHOKUBAI CO., LTD.** [JP/JP]; 1-1, Koraibashi 4-chome, Chuo-ku, Osaka-shi, Osaka 541-0043 (JP).

(72) Inventors; and

(75) Inventors/Applicants (*for US only*): **NAKASHIMA, Yasuhisa** [JP/JP]; D-413, 931-11, Hamada, Aboshi-ku, Himeji-shi, Hyogo 671-1242 (JP). **IKEUCHI, Hiroyuki** [JP/JP]; G-405, 931-11, Hamada, Aboshi-ku, Himeji-shi, Hyogo 671-1242 (JP). **FUJITA, Yasuhiro** [JP/JP]; 63-11, 107, Komatsu-cho 1-chome, Hirohata-ku, Himeji-shi, Hyogo 671-1252 (JP). **NAGASAWA, Makoto** [JP/JP]; D-107, 931-11, Hamada, Aboshi-ku, Himeji-shi, Hyogo 671-1242 (JP). **SAKAMOTO, Shigeru** [JP/JP];

E-203, 931-11, Hamada, Aboshi-ku, Himeji-shi, Hyogo 671-1242 (JP). **DAIROKU, Yorimichi** [JP/JP]; 24, Miyake 1-chome, Shikama-ku, Himeji-shi, Hyogo 672-8048 (JP). **WADA, Katsuyuki** [JP/JP]; 10-5, Taderahigashi 4-chome, Himeji-shi, Hyogo 670-0081 (JP). **FUJINO, Shinichi** [JP/JP]; 550-4, Hamada, Aboshi-ku, Himeji-shi, Hyogo 671-1242 (JP). **KITAYAMA, Toshimasa** [JP/JP]; E-103, 931-11, Hamada, Aboshi-ku, Himeji-shi, Hyogo 671-1242 (JP). **HITOMI, Kazuhisa** [JP/JP]; 4-168-1-405, Yasudada, Himeji-shi, Hyogo 670-0955 (JP).

(74) Agent: **MATSUMOTO, Takehiko**; 25-6, Hannan-cho 1-chome, Abeno-ku, Osaka-shi, Osaka 545-0021 (JP).

(81) Designated States (*national*): BR, CN, PL, US.

(84) Designated States (*regional*): European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR).

Published:

— *with international search report.*

(88) Date of publication of the international search report:
30 May 2003

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: **WATER-ABSORBING AGENT, ITS PRODUCTION AND SANITARY MATERIAL**

(57) Abstract: There is provided: a production process for a water-absorbing agent having stable properties in a short time; and a water-absorbing agent. The production process comprises the step of blending an acid-group-containing water-absorbent resin powder with a noncrosslinkable water-soluble inorganic base and/or an irreducible alkaline-metal-salt pH buffer and further with a dehydratable crosslinking agent reactable with the acid group, thereby subjecting the resin powder to crosslinking treatment, or comprises the step of blending an acid-group-containing water-absorbent resin powder with the above base and/or pH buffer and further with a crosslinking agent reactable with the acid group, thereby subjecting the resin powder to crosslinking treatment, wherein the resin powder has a weight-average particle diameter of 300 to 600 µm wherein the ratio of fine powders having particle diameters of not larger than 150 µm in the resin is not more than 10 weight %.

WO 02/100451 A3

INTERNATIONAL SEARCH REPORT

International Application No
PCT/JP 02/05642A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A61L15/60 A61F13/15

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 A61L C08J B01J C08F A61F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 882 502 A (NIPPON CATALYTIC CHEM IND) 9 December 1998 (1998-12-09) cited in the application examples 1-4 claims	1-21
X	EP 1 029 886 A (NIPPON CATALYTIC CHEM IND) 23 August 2000 (2000-08-23) paragraph '0118! page 6, line 26 -page 7, line 18 claims	1-21
X	WO 00 53644 A (STOCKHAUSEN CHEM FAB GMBH ;HARREN JOERG (DE); MERTENS RICHARD (DE)) 14 September 2000 (2000-09-14) examples 1-8 claims	1-21

☐ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

* Special categories of cited documents:

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the International filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the International filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *&* document member of the same patent family

Date of the actual completion of the International search

27 January 2003

Date of mailing of the International search report

04/02/2003

Name and mailing address of the ISA
European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Thornton, S

INTERNATIONAL SEARCH REPORT

International Application No
PCT/JP 02/05642

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☒ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
see FURTHER INFORMATION sheet PCT/ISA/210
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box I.2

Present claims 1,3,4,6-8 relate to a water-absorbing agent defined (inter alia) by reference to the following parameters:

- P1: 30 minutes absorption capacity...
- P2: 60 minute absorption capacity...
- P3: saline flow conductivity...
- P4: SFC variation index...
- P5: SFC variation coefficient...
- P6: SFC variation rate...
- P7: SFC standard deviation...

The use of these parameters in the present context is considered to lead to a lack of clarity within the meaning of Article 6 PCT. It is impossible to compare the parameters the applicant has chosen to employ with what is set out in the prior art.

In view of the large number and also the wording of the independent claims (1,6,7,8,9,10,20,21) presently on file, which render it difficult, if not impossible, to determine the matter for which protection is sought, the present application fails to comply with the clarity and conciseness requirements of Article 6 PCT (see also Rule 6.1(a) PCT) to such an extent that a meaningful search is impossible.

The lack of clarity is such as to render a meaningful complete search impossible. Consequently, the search has been restricted to:

a water-absorbing agent, which is a particulate water-absorbing agent obtained by a process including the steps of: polymerising a monomer including an acid-group-containing monomer (salt); and then post-neutralizing the resultant polymer; and then surface-crosslinking the resultant water-absorbent resin wherein the production process comprises the step of blending a water-absorbent powder with a noncrosslinkable water-soluble inorganic base with the water-absorbing agent being characterized in that: the particulate water-absorbing agent includes particles having particle diameters of smaller than 850 um but not smaller than 150 um in a ratio of not less than 90 weight% of all particles of the particulate water-absorbing agent.

The applicant's attention is drawn to the fact that claims, or parts of claims, relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/JP 02/05642

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 0882502	A	09-12-1998	EP 0882502 A1	09-12-1998
			US 6187872 B1	13-02-2001
			WO 9805420 A1	12-02-1998
			JP 3325806 B2	17-09-2002
			JP 10101735 A	21-04-1998
EP 1029886	A	23-08-2000	EP 1029886 A2	23-08-2000
			JP 2000302876 A	31-10-2000
WO 0053644	A	14-09-2000	DE 19909838 A1	07-09-2000
			AU 2915500 A	28-09-2000
			BR 0008727 A	26-12-2001
			CN 1342174 T	27-03-2002
			CZ 20013128 A3	12-12-2001
			WO 0053644 A1	14-09-2000
			EP 1165631 A1	02-01-2002